Fisheries and Oceans Canada | Pêches et Océans Canada
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Canadian Science Advisory Secretariat
Science Response 2015/006

Quebec Region

UPDATE OF STOCK STATUS INDICATORS FOR NORTHERN SHRIMP IN THE ESTUARY AND GULF OF ST. LAWRENCE

Context

The stock assessment of Northern Shrimp (*Pandalus borealis*) in the Estuary and Gulf of St. Lawrence is conducted every two years, with the most recent assessment completed in January 2014. The precautionary approach adopted for this fishery demands an annual update of the stock status indicator. The main indicator of stock status is calculated from the indices obtained from the summer commercial fishery and the Fisheries and Oceans Canada (DFO) research survey. This update has been prepared to provide the Fisheries Management the projected harvest for 2015 in the four shrimp fishing areas (SFA 8, 9, 10 and 12) according to the guidelines of the precautionary approach.

This Science Response Report results from the Science Response Process of January 15, 2015 on the update of stock status indicators for Northern Shrimp in the Estuary and Gulf of St. Lawrence.

Background

The Northern Shrimp fishery in the Gulf of St. Lawrence is conducted by trawlers in four shrimp fishing areas (SFA): Estuary (SFA 12), Sept-Iles (SFA 10), Anticosti (SFA 9) and Esquiman (SFA 8).

Shrimp fishing is regulated by a number of management measures, including the setting of total allowable catches (TAC) in the four areas. TAC-based management limits fishing in order to protect the reproductive potential of the population. The essential elements for the establishment of a precautionary approach were adopted in 2012. Reference points were determined and harvest guidelines were established based on the main indicator and its position in relation to the stock status classification zones (healthy, cautious and critical). Once the harvest is projected, decision rules are applied by Fisheries Management to determine the TAC.

Description of the fishery

Preliminary statistics in 2014 indicate that the landings from all areas were 29,236 tons for a possibility of 30,711 tons. In 2014, the TAC was reduced by 15% in Estuary and Sept-Iles fishing areas and by 12.2% in Esquiman, and increased by 15% in Anticosti. The preliminary landings reached around 95% of the TAC in all areas (Figure 1).

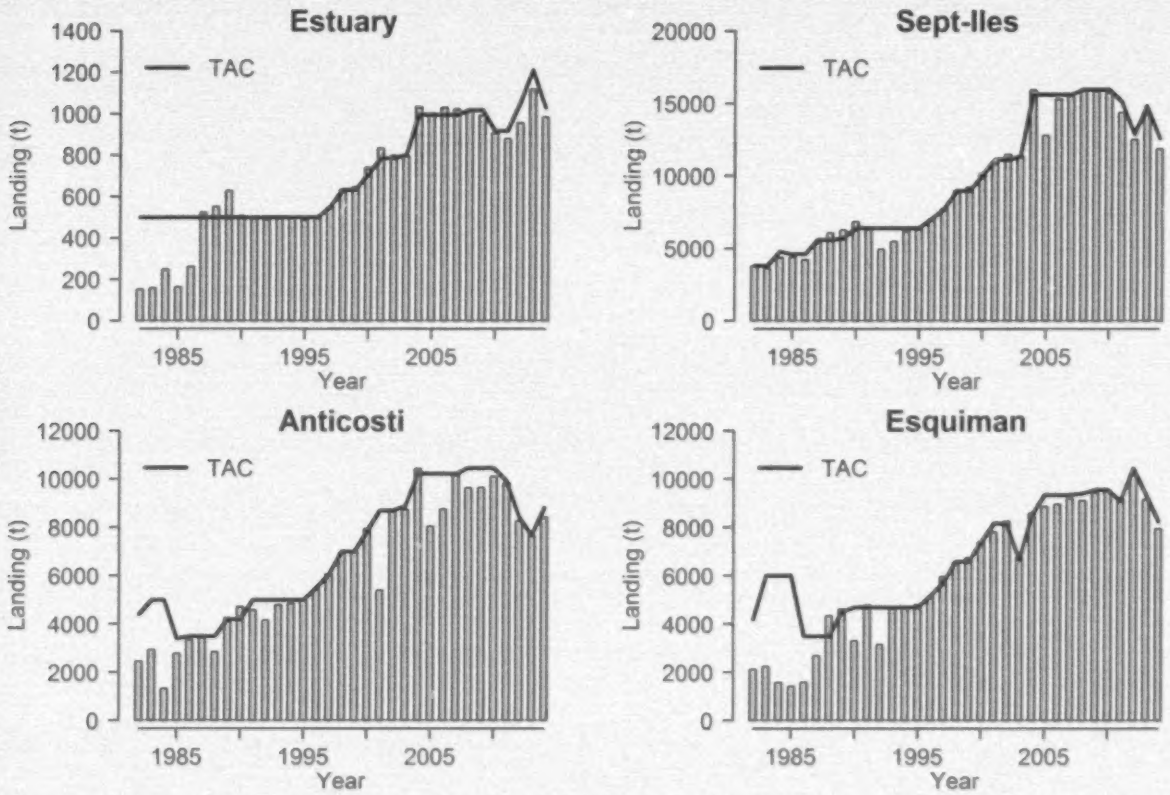

Figure 1. Landings and total allowable catch (TAC) by fishing area and by year. The 2014 landings data are preliminary.

Analysis and Response

Abundance indices

The update of the main stock status indicator is based on two independent sources of data, the number per unit of effort (NPUE) from the summer commercial fishery (June, July and August) and the index of abundance from the DFO research survey. From these two sources of data, indices for male and female components are estimated, for a total of four indices by fishing area. In order to combine them into one indicator, each index is standardized in relation to a reference period.

All indices for the male component increased in 2014 compared to 2013 with the exception of the index from the research survey in Estuary (Figure 2). For the female component, research survey indices increased in 2014 for Estuary and Sept-Iles while they decreased for Anticosti and Esquiman. The fishery indices for the female component increased in 2014 for Estuary and Esquiman, and decreased for Sept-Iles and Anticosti.

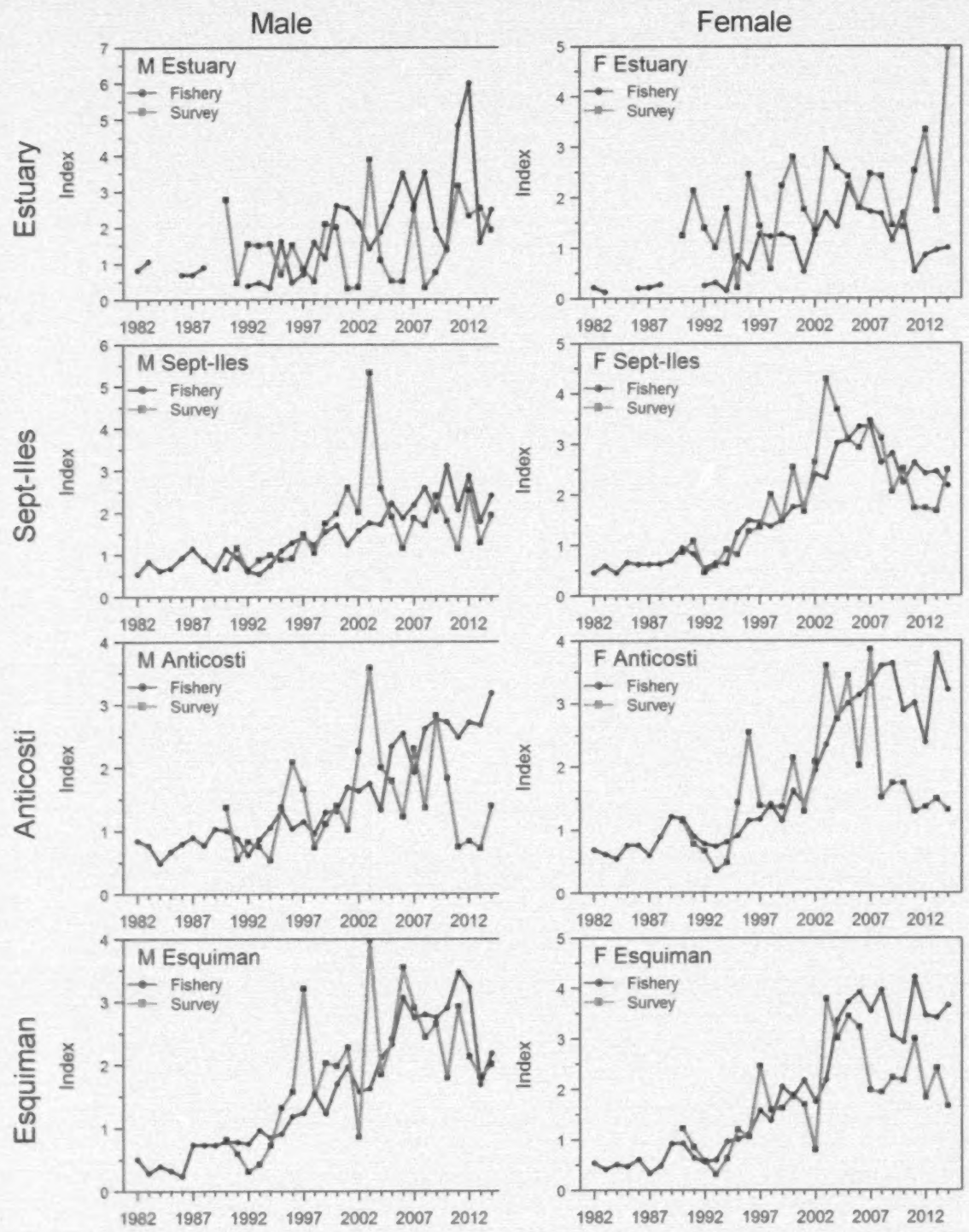

Figure 2. Standardized indices from the commercial fishery (blue) and the research survey (red) for males (M) and females (F) by fishing area and year.

Main stock status indicator

For each stock, the main stock status indicator represents the mean of the four indices, those of the males and females obtained from summer commercial fishery and the DFO research survey.

The indicator of the status of each of the stocks increased in 2014 compared to 2013. These increases were strong for Estuary and Sept-Iles, while they are low for Anticosti and Esquiman (Figure 3). The four Northern Shrimp stocks in the Estuary and the Gulf of St. Lawrence have remained in the healthy zone since the early 2000s.

The main indicator for Estuary shows large inter-annual variations in recent years. It increased in 2014, following a sharp decline in 2013 and approaches the value observed in 2011. For Sept-Iles, the indicator shows a downward trend for several years with high inter-annual variations in the last four years. For Anticosti, the indicator in 2014 increased for a second consecutive year to reach the value similar to that observed in 2010. The indicator of Esquiman stabilized in 2014 after two years of decline.

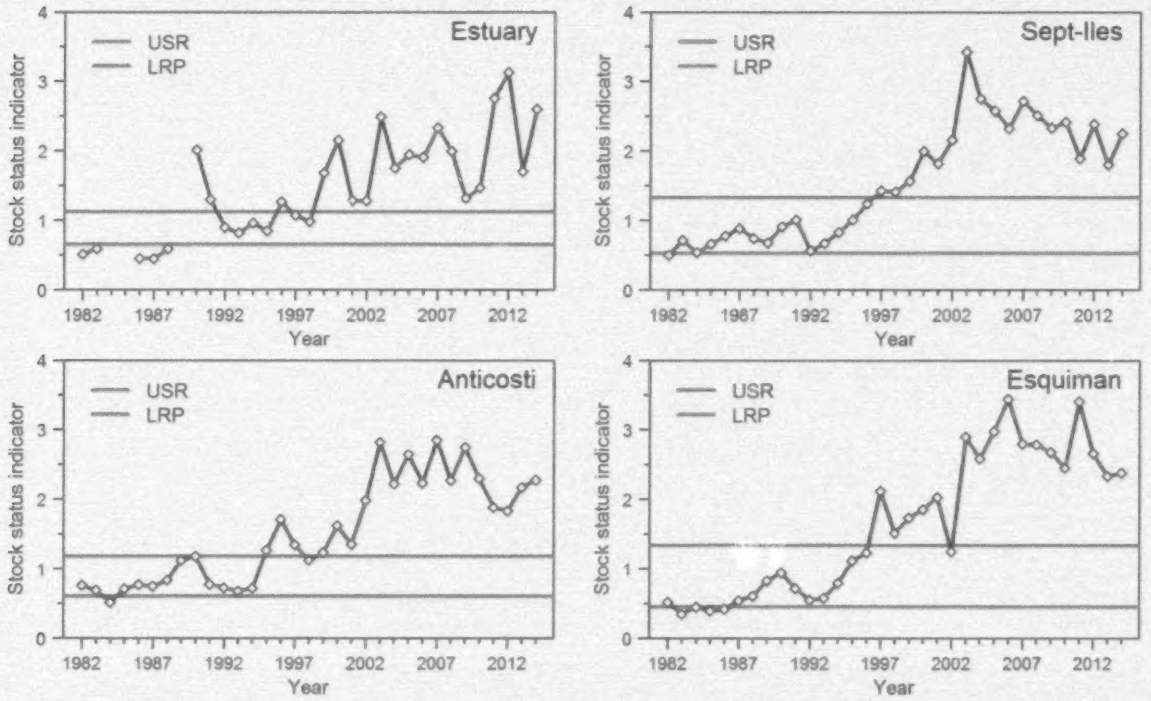

Figure 3. Main stock status indicator by year and limit (LRP) and upper (USR) stock reference points for each fishing area.

Conclusions

The main stock status indicator shows that the four stocks were in the healthy zone in 2014. Moreover, the main indicators increased or remained stable in 2014. According to the guidelines, the projected harvests for 2015 are 1,225 t for Estuary, 13,224 t for Sept-Iles, 9,511 t for Anticosti and 8,396 t for Esquiman (Figure 4).

The 2015 TACs will be determined by Fisheries Management from these harvest values according to the decision rules.

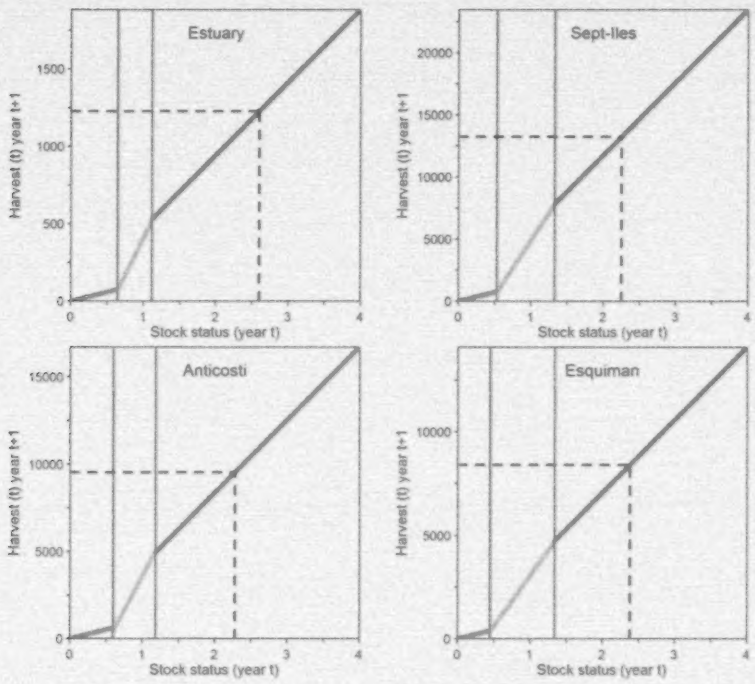

Figure 4. Harvest guidelines by fishing area. The projected harvest for 2015 is shown (dashed line) in view of the main stock indicator in 2014.

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Sources of information

DFO. 2014. Assessment of Northern Shrimp stocks in the Estuary and Gulf of St. Lawrence in 2013. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/016.

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